higher in patients treated with conventional radiotherapy. OS at 2 and 5 years for the accelerated radiotherapy group were 16% and 3%, respectively, and 44% and 19% for the conventional radiotherapy group (P<0.00001). However, there was no statistical difference in LRC, DFS and DMFS between the two groups. LRC at 2 and 5 years for the accelerated radiotherapy group were 47% and 19%, compared to 48% and 37% for the conventional radiotherapy group. DFS at 2 and 5 years for the accelerated group were 24% and 10%, 30% and 19% for the conventional radiotherapy group. In terms of toxicity, 12 patients (11%) had Common Toxicity Criteria for Adverse Events (CTCAE) grade 3 or more treatment related pneumonitis. 6 patients (5%) had CTCAE grade 3 acute esophagitis and only 1 patient had RTOG grade 3 late esophageal toxicity.

Conclusions: In spite of treating the patients with poorer PF, accelerated radiotherapy of 45 Gy in 15 fractions over 3 weeks achieved comparable local-regional control for Stage III NSCLC with conventional radiotherapy. Toxicity of accelerated radiotherapy was acceptable. Accelerated radiotherapy is reasonable strategy for patients who have locally advanced NSCLC with unfavorable prognostic factors, since their main goal of treatment is to improve their quality of life within a limited time.

PD5-2-2 **Clinical Data from Radiation Therapy, Thu, 12:30 - 14:15**

Impact of mediastinal nodal mobility on the accuracy of transbronchial needle aspiration (TBNA) without real-time imaging

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Background: The diagnostic yield of TBNA can be highly variable, with a meta-analysis reporting the pooled sensitivity and specificity to be only 39% and 99%, respectively. Nodal position is often estimated from the distance between the carina and a visible lymph node, as measured on a diagnostic CT scan. However, breath-hold conventional CT scans do not account for nodal motion, and nodal motion may explain the lower yields when TBNA is performed without real-time ultrasound imaging. We studied mediastinal nodal motion on 4-dimensional (4D) CT scans.

Methods: A total of 47 distinct mediastinal nodes were identified on 4DCT scans performed for radiotherapy planning in 25 patients with lung cancer. Nodes were mainly located at station 4R, 4L, 7 and 2R and each identified node was contoured in all 10 phases of the 4DCT. Nodal motion was derived from the displacement of the center of mass in the respiratory phases. In order to evaluate whether the distance between the center of mass of each node and the carina remained constant during the respiratory cycle, this distance was derived for all respiratory phases using the coordinates of both structures.

Results: The mean nodal diameter was 10.2 ± 4.0 mm (1SD) and mean nodal volume 1.8 ± 2.3 cc. Mobility was maximal in the cranio-caudal axis (mean of 4.7 ± 2.3 mm) and the corresponding medio-lateral and ventro-dorsal mobility was 2.8 ± 1.9 mm and 2.4 ± 1.8 mm, respectively. The mean 3-dimensional displacement of nodal center was 6.2 ± 2.9 mm, and this exceeded 10 mm in 5 nodes (Table 1). The nodal mass was constantly present in only 25 ± 14% of the region encompassing all nodal positions. The mean variation in cranio-caudal distance between all nodes and carina position during respiration was 5.3 ± 2.1 mm (range 2.2-10.5 mm).

Conclusions: Both nodal motion and the varying distance between carina and nodal position, may explain the lower diagnostic yields for TBNA procedures performed without real-time guidance.

Table 1: Three-dimensional nodal mobility per location studied

Location	No. of nodes	med-lat (mm)		ventro-dors (mm)		cran-caud (mm)		3D vector (mm)	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
2L	2	2.3	1.4	1.8	1.2	3.2	1.0	4.4	2.0
2R	7	2.4	2.5	2.1	2.5	2.6	1.8	4.3	2.9
4L	9	1.9	1.2	1.9	0.8	5.1	1.2	5.8	1.5
4R	14	2.9	1.3	2.5	1.5	4.8	2.5	6.4	2.6
5	4	4.7	3.3	3.6	4.6	5.9	1.8	8.7	5.2
6	2	3.0	0.7	6.1	2.7	4.9	0.5	8.4	2.5
7	7	3.8	1.6	2.2	1.1	6.5	2.3	8.1	2.2
8	2	1.5	1.1	0.8	0.2	1.7	0.4	2.4	1.0
All nodes	**47**	**2.8**	**1.9**	**2.4**	**1.8**	**4.7**	**2.3**	**6.2**	**2.9**

PD5-2-3 **Clinical Data from Radiation Therapy, Thu, 12:30 - 14:15**

Translating research into routine clinical practice: image-guided lung stereotactic radiation therapy for unresectable patients with early stage lung cancer

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Background: Stereotactic Body Radiation Therapy (SBRT) has emerged as a non-invasive treatment option for unresectable early stage non-small cell lung cancer (NSCLC), delivering very high radio-ablative doses of RT to the primary tumor. To ensure efficacy of treatment and patient safety, high precision planning and careful treatment delivery under vigilant quality assurance are needed. We present the evolution of SBRT practice at Princess Margaret Hospital with an emphasis on accuracy of treatment set up and verification using image-guided techniques.

Methods: From Oct 2004 to Feb 2007, we treated 46 patients (pts) with T1T2N0MO NSCLC with SBRT (48 tumors were treated). RT schedule for peripheral tumors was 60 Gy/3 fractions over 2 weeks (for 29 tumors, 12 of the pts were part of the RTOG 0236 phase II study). When organ at risk tolerance doses were not achievable, either 54 Gy/3 fr (3 pts) or 48 Gy/4 fr (10 tumors, all T1) was employed. Central tumors were treated with a lower dose of 50 Gy/10 fr schedule (6 pts). 4DCT simulation was acquired in all but 9 pts who were too large for the scanner. All tumor and normal tissue contours and final plans are reviewed in weekly multidisciplinary SBRT rounds. On the treatment unit, cone beam CT (CBCT) is used for image guidance with therapist manually matching directly to the tumor, adjusting the patient's position for discrepancies >3mm. CBCT is performed for initial localization and repeated during treatment to verify the tumor position. We compared CBCT soft tissue (tumor) matching to bone matching (which would mimic matching used in conventional portal imaging). Patients are followed every 3 months with radiological and clinical assessment.

Results: Median pt age was 73 yrs (48-96); mean tumor size was 2.6 cm (range 0.7-5.7). Median follow-up is 10 mo (range 0-26 mo). Acute RT toxicity was generally mild with grade G1 fatigue the most common